

In the Matter of)
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The Commission Seeks Public Comment) IB Docket No. 04-286
On Recommendations Approved by the)
Advisory Committee for the 2007 World)
Radiocommunication Conference)

To: The Commission

Northrop Grumman Space & Mission Systems Corporation (“NGST”), by its attorneys, hereby files these Comments in response to the Public Notice in which the Commission requests comments on the latest Executive Branch agencies’ draft of U.S. proposals for Agenda Item 1.20 of the 2007 World Radiocommunication Conference (“WRC-07”).¹ Agenda Item 1.20 concerns the possible adoption of regulatory measures for the protection of the Earth Exploration-Satellite Service (Passive) service (“EESS-P”) in various frequency bands.

One of the frequency bands that is included in the draft proposals for Agenda Item 1.20 that the Executive Branch agencies have produced is the EESS-P frequency band at 50.2-50.4 GHz. NGST is the sole current applicant in the United States for a commercial fixed-satellite service (“FSS”) system that will operate Earth-to-space FSS links in the frequency band 47.2-50.2 GHz, which is

¹ Public Notice, IB Docket No. 04-286, *FCC Seeks Additional Comment on Recommendations Approved by the Advisory Committee for the 2007 World Radiocommunication Conference Regarding the Regulatory Measures for the Protection of the Earth Exploration-Satellite Service (Passive) from Unwanted Emissions of Active Services*, DA 06-2262 (November 1, 2006) (“*Notice*”). NGST intends these Comments to be in additional to the comments NGST is providing on this date in its capacity as an Executive Member of the Satellite Industry Association (“SIA”).

immediately adjacent to the 50.2-50.4 GHz EESS-P frequency band. NGST has participated actively in the studies undertaken by the International Telecommunication Union ("ITU") task group that is addressing the technical aspects of Agenda Item 1.20, and has been very concerned for some time that studies of measures needed to protect EESS-P at 50.2-50.4 GHz are leading to overly conservative protection requirements due to the use in studies of unrealistic characteristics for FSS systems and networks, particularly for gateway/HUB applications that will operate in the adjacent uplink band. Regrettably, the latest iteration of the Executive Branch agencies' proposal for criteria to protect EESS-P operations in the 50.2-50.4 GHz band is an outgrowth of these unrealistic studies, and adoption of the proposal put forth for new ITU Radio Regulation No. 5.DDD (Proposal USA/ /10)² would unduly and unnecessarily constrain the use NGST intends to make of the FSS uplink band at 47.2-50.2 GHz.

The Executive Branch agencies propose that the following footnote, denominated No. 5.DDD, be added to the table of frequency allocations in Article 5 of the ITU Radio Regulations for the band 47.2-50.2 GHz:

USA/ /10 ADD

5.DDD In order to ensure the protection of the Earth exploration-satellite (passive) service in the band 50.2-50.4 GHz, the unwanted emissions e.i.r.p. in the 50.2-50.4 GHz band of any earth station in the fixed-satellite service operating either in the band 47.2-50.2 GHz or in the band 50.4-51.4 GHz shall not exceed 43 dBW/200 MHz under clear sky conditions, or 49 dBW/200 MHz under fading conditions. This provision shall apply only to fixed-satellite service earth stations brought into use after 9 November 2007. The Bureau shall make neither examination nor finding with respect to this provision under either Article **9** or **11**.

² See Notice, at Annex III, pp. 14-15.

Notice, at Annex III, pp. 14-15. As a reason for the proposal, the Executive Branch agencies assert that “[r]esults of studies documented in Recommendation ITU-R SM.1633 show that fixed-satellite service uplink transmitters operating in bands adjacent to then 50.2-50.4 GHz passive band can cause significant levels of unwanted emissions in the 50.2-50.4 GHz passive band.” *Id.* at 15.

In comments that it provided to the WRC-07 Advisory Committee (“WAC”) earlier this year, Informal Working Group 2 (on satellite services and HAPS) introduced the concept that the protection criterion for EESS-P operations should be expressed as a clear-sky level, with an allowance of a to-be-determined increase in earth station transmit power density to overcome fading conditions without causing additional impact to EESS-P systems. *Id.* This feature would incorporate the fact that because, in general, both wanted and interfering paths would experience the same propagation conditions, Earth stations that increase their transmit power density levels during fading conditions would not cause additional interference to EESS-P sensors. The actual power increase would depend on rain rate locations/regions.

To the extent that the revised Executive Branch agencies’ proposal for new No. 5.DDD includes the clear-sky/fading conditions distinction, NGST considers this to be progress, and is pleased to see the concept included. Similarly a helpful clarification is the new final sentence that specifies that the Radiocommunication Bureau is not to conduct an examination of earth station compliance with the specified mandatory limitations. There still is some room for improvement, however, on other conditions and terms.

First, NGST would prefer to see the protection for EESS-P at 50.2-50.4 GHz that is provided in No. 5.DDD limited to FSS earth stations in only the upper 500 MHz of the 47.2-50.2 GHz band. Earth stations using frequencies more than 500 MHz removed from the 50.2-50.4 GHz band have no chance of producing unwanted emissions that exceed EESS-P protection criteria. NGST notes that for the FSS uplinks in 30-31 GHz, a separation of 300 MHz from the EESS-P allocation that begins at 31.3 GHz was deemed sufficient; the protection criteria for EESS-P at 31.3-31.5 GHz and 50.2-50.4 GHz are similar. Effecting this change would require some revision to the Executive Branch agencies' proposal for the table of frequency allocations itself in USA/ 19.³ *See Notice*, at 14. A suggested redline of this element of the Executive Branch agencies' proposal for Agenda Item 1.20 is included in the Attachment to these Comments.

Second, NGST would prefer to see the criterion in No. 5.DDD expressed in terms of the level of unwanted emissions from the transmit power density at the input of an earth station antenna in the 49.7-50.2 GHz band falling into the EESS-P band at 50.2-50.4 GHz, rather than as an unwanted emission level from FSS earth station e.i.r.p. density. This is a much more understandable condition for FSS operators, and as long as the level is based on the protection of the EESS-P, it should achieve the intended objective.

Third, NGST would prefer to distinguish, for purposes of regulation, between very small aperture terminals ("VSAT") that would be employed for user-level

³ Although NGST does not have a stake in the 50.4-51.4 GHz FSS band, which is also addressed in No. 5.DDD, it believes that for consistency, the band subject to limitation should be restricted to the immediately adjacent 500 MHz – i.e., the 50.4-50.9 GHz band – for the same reasons.

operations in the 49.7-50.2 GHz FSS uplink band and gateway/HUB terminals of which there would only be a small number possible within the field-of-view of an EESS-P satellite. Because of the small number of gateway/HUB terminals and the fact that such terminals operate with bigger antennas with better antenna roll-off characteristics, the gateway/HUB terminals can be allowed to have higher transmit power density levels than the VSAT terminals.

Finally, NGST would prefer to have the new provision apply only to satellite networks for which complete coordination or notification information, as appropriate, is received by the ITU Radiocommunication Bureau on or after the date of entry into force of the Final Acts of WRC-07, rather than to fixed-satellite service earth stations brought into use after 9 November 2007, as the Executive Branch agencies now propose.⁴ This is the conventional manner in which the effective date of limitations that become applicable to FSS systems and networks has been treated in recent WRCs.⁵ The proposal of the Executive Branch agencies to subject filed systems and networks to limitations to be adopted at WRC-07 amounts to retroactive application of WRC-07 decisions.⁶ Retroactive application of

⁴ Interestingly, the revised Executive Branch agencies' proposal marks a step backward on this point. In the original proposal, the agencies proposed that FSS *systems* in operation at the date of entry into force of the Final Acts of WRC-07 not be subject to this limit. *See Notice*, at Annex I, Proposal USA/10, No. 5.DDD. The date of entry into force of the Final Acts of WRC-07 is not yet set, but will likely be 1 January 2009. Now, the agencies propose that the limits they seek apply to any FSS *earth station* brought into use after the last day of WRC-07 – apparently without regard to whether the FSS system or network with which the earth station operates is in operation or not as of the end of WRC-07.

⁵ *See, e.g.*, No. 22.5H (limiting applicability of certain EPFD limits first adopted for FSS systems at WRC-97 in certain FSS frequencies to “systems in the fixed-satellite service for which complete coordination or notification information, as appropriate, has been received by the Bureau before 22 November 1997” (the last day of WRC-97).

⁶ Specifically, earth stations operating with FSS systems that are existing or planned would have to meet the new limits in No. 5.DDD as proposed from the day after WRC-07 ends, even if the limits prevented earth stations of the size and type in use prior to the end of WRC-07. That type of

resulting regulations is not contemplated by Resolution 738 (WRC-03), and should be opposed by the Commission in its reconciliation discussions with the National Telecommunications and Information Administration.

When all of these changes are factored in, the Executive Branch agencies' proposal for No. 5.DDD would be changed further as shown below:⁷

USA/ 10 ADD

5.DDD In order to ensure the protection of the Earth exploration-satellite (passive) service in the band 50.2-50.4 GHz, the level of unwanted emissions from the transmit power density at the input of a fixed-satellite service earth station antenna in the band 49.7-50.2 GHz or in the band 50.4-50.9 GHz falling into the 50.2-50.4 GHz EESS band [shall] not exceed -15 dBW/200 MHz for VSAT/user-type terminals and -7 dBW/200 MHz for gateway/HUB applications under clear sky conditions. During fading conditions, these transmit power density levels can be exceeded by the amount that is needed to maintain link availability during fading conditions. This provision shall apply only to earth stations of fixed-satellite service networks and systems for which complete coordination or notification information, as appropriate, was received by the Bureau on or after [the date of entry into force of the Final Acts of WRC-07]. The Bureau shall make neither examination nor finding with respect to this provision under either Article 9 or 11.

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Once the Commission and NTIA agree on this formulation, there would need to be a consequential revision to the "reasons" statement under the proposal.

In summary, NGST fully supports the objective of ensuring that the EESS-P service is adequately protected from unwanted emissions of adjacent band active

limitation on systems existing or planned as of the end of WRC-07, or whenever the new provisions become effective, is a retroactive application of the new radio regulation.

⁷ NGST has placed the "shall" in No. 5.DDD in square brackets, in recognition of the fact that SIA, and perhaps others, have raised issues over whether the restrictions on active services proposed in the various provisions of the proposals on Agenda Item 1.20 for WRC-07 are to be mandatory or voluntary. The levels NGST identifies in its version of No. 5.DDD would be acceptable to NGST under either regulatory outcome.

services. As shown in these Comments, NGST believes that this objective can be satisfied with the adoption of a protection criterion that is different from the criterion specified in the current set of Executive Branch proposals for WRC-07 Agenda Item 1.20 in the band 50.2-50.4 GHz from FSS uplink operations in the 47.2-50.2 GHz band. NGST encourages the Commission, in reconciling the industry and government views on U.S. proposals to WRC-07 under Agenda Item 1.20, to urge incorporation of the criteria NGST suggests here for the protection of EESS-P operations at 50.2-50.4 GHz.

Respectfully submitted,

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December 6, 2006

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